

Exhibit A

Part 4 of 5

DEPOSITION OF JAY VANDEVEN, VOLUME II, 2/14/07

1 that they -- could you still call
2 something that was sulfuric acid that
3 had a pH closer to 7 sulfuric acid,
4 possibly, theoretically.

5 But if they are calling
6 something acid waste, they are
7 referring to a waste that has a low
8 enough pH, an acidity that is going
9 to impact the environment.

10 BY MR. COOLEY:

11 Q. I understand what you are
12 saying, and several questions ago I
13 was trying to get an understanding
14 from you as to what kind of pH range
15 would cause EPA to have such a
16 concern.

17 I would like you to tell me
18 what range of pH you think EPA would
19 view as needing to be present in
20 order for EPA to have a concern about
21 that particular acid.

22 MR. HARRIS: Objection.
23 Asked and answered.

24 THE WITNESS: I couldn't --



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1 I couldn't tell you a pH range that
2 would cause them concern.

3 BY MR. COOLEY:

4 Q. Can you tell me a pH range
5 that would cause you concern?

6 MR. HARRIS: Objection.

7 Asked and answered.

8 THE WITNESS: No.

9 BY MR. COOLEY:

10 Q. Just to be clear, by
11 causing you concern, that's a pretty
12 loose expression.

13 I would like to use the
14 description you gave a couple of
15 answers ago which concerned the
16 effect of or the anticipated effect
17 of the acid in question on the
18 environment or other materials.

19 And so if I were to
20 rephrase my question to ask you if
21 you can tell me what range of pH you
22 would view as being the range that
23 could have such an effect, can you
24 now tell me what that range might be?



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1 MR. HARRIS: Objection.

2 Asked and answered.

3 THE WITNESS: No. Again,
4 that's just one characteristic of
5 this hypothetical waste that you are
6 talking about, so I couldn't give you
7 a pH range that would quote cause me
8 concern.

9 It would depend on other
10 factors such as the volume of the
11 waste, what else was in the waste,
12 where it was disposed of at a site.

13 So just giving a pH range
14 that would cause me concern is not a
15 question that I could answer.

16 BY MR. COOLEY:

17 Q. But you said to me a few
18 minutes ago that you don't believe
19 that when EPA describes acids or
20 waste acids and investigates and
21 takes steps to address acid wastes
22 that it has in mind materials that
23 are near neutral.

24 Is that a fair summation of



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1 what you said a minute ago?

2 A. I believe what I said was
3 that if they are describing something
4 as acid waste, if they are concerned
5 about it having been spilled at the
6 site or buried in drums at the site
7 and they are referring to it as acid
8 waste, they are concerned about that
9 characteristic of the waste, the
10 acidity of the waste, the pH of the
11 waste to a level that indicates to
12 them that it could have some negative
13 impact on the environment.

14 Q. Do you know what the range
15 of pH in the soils in the drum
16 disposal, excavation area was when
17 those soils were sampled?

18 A. No, I don't.

19 Q. Can you identify what the
20 inorganic contaminants of concern as
21 EPA listed them are at this site?

22 A. Well, I could provide at
23 least a partial list without any
24 documents in front of me. I could



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1 provide a more complete list with the
2 ROD in front of me.

3 Q. Okay. Well, just from your
4 recollection, what can you identify?

5 MR. HARRIS: What was the
6 question now, which kinds of metals
7 are what?

8 MR. COOLEY: Inorganic
9 contaminants of concern as identified
10 by EPA.

11 MR. HARRIS: As in COPC?

12 MR. COOLEY: No. COCs,
13 contaminants of concern.

14 THE WITNESS: They
15 identified many inorganic
16 contaminants from some metals that we
17 have talked about thus far; chromium,
18 arsenic, zinc, lead, copper,
19 manganese.

20 That's an incomplete list
21 because the list is substantially
22 larger than that.

23 BY MR. COOLEY:

24 Q. It's not a test, that's



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1 okay. I just wanted to see what you
2 could say with confidence, so from
3 your recollection, based on your
4 review of the various materials you
5 have looked at.

6 But just to make sure I
7 understand your answer, my question
8 was what contaminants of concern,
9 COCs, do you recall EPA having
10 identified.

11 Mr. Harris questioned
12 whether I meant COPCs, contaminants
13 of potential concern, and I said no,
14 I meant COCs. And your answer was
15 that the EPA identified many
16 contaminants at the site.

17 I take the word
18 contaminants when it is generally
19 used in environmental matters to be,
20 you know, any contaminant or often
21 hazardous substance that just may be
22 present and detectable, other than
23 naturally occurring if it's a
24 contaminant.



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1 But that wasn't my
2 question, my question was what COCs,
3 or contaminants of concern.

4 So did the metals you
5 listed, are they, to you,
6 contaminants of concern as EPA
7 identified them?

8 A. That would be -- again,
9 that would be a partial list of the
10 contaminants that were of concern at
11 the site, yes.

12 Q. But each of those you
13 understand to be a COC as defined by
14 EPA on the site?

15 MR. HARRIS: That's I guess
16 the basis for my objection. Are you
17 suggesting that there is such a
18 definition? Are you asking about
19 some specific EPA definition or are
20 you just asking what they were
21 concerned about?

22 BY MR. COOLEY:

23 Q. Let me ask you, do you
24 understand the acronym COPC, as used



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1 in the Superfund process?

2 A. I understand that
3 abbreviation, yes.

4 Q. What does it stand for?

5 A. Contaminants of potential
6 concern.

7 Q. And how and where is it
8 used in the Superfund process?

9 A. That concept would be used
10 in many stages of the Superfund
11 process. You may have contaminants
12 of potential concern starting from
13 the very initial stages of the
14 Superfund process, from the listing
15 process.

16 You may have information
17 about past disposal at a site that
18 help you identify contaminants of
19 potential concern even before you do
20 the preliminary assessment or site
21 inspection.

22 You may have contaminants
23 of potential concern as you move
24 through the HRS process.



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1 As you initiate your site
2 investigation you will identify
3 contaminants of potential concern to
4 help guide how you do the
5 investigation and the analytical
6 procedures that you use to analyze
7 samples.

8 You will have contaminants
9 of potential concern relating to
10 human health and ecological risks at
11 the site.

12 You may have contaminants
13 of potential concern that you
14 identify because of the remedies that
15 you are contemplating at the site
16 both in terms of cleanup levels that
17 you need to meet and other ARARs that
18 you need to meet, and they may be
19 contaminants of potential concern.

20 So that concept and the use
21 of that term is used throughout the
22 Superfund process.

23 Q. Okay. Are you familiar
24 with the acronym COC in the Superfund

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1 process or context?

2 A. In general, yes.

3 Q. And what does it stand for?

4 A. Not anything dissimilar
5 from what I just described.

6 As you move through the
7 process and you gather more data, for
8 instance as you gather more
9 characterization data, as you gather
10 more detailed records about the
11 history of the site, as you narrow
12 down what your remedies are going to
13 be, as you narrow down what your
14 ARARs are going to be, that list of
15 contaminants of potential concern may
16 become reduced to contaminants of
17 concern.

18 That's generally how it is
19 used. But it's a fairly -- it's not
20 a very rigid -- that's not a very
21 rigid set of concepts.

22 Q. Okay. So with that
23 understanding as to what a COC is,
24 again just for clarification, is it



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1 still your response that chromium,
2 arsenic, zinc, lead, copper and
3 manganese represent a partial listing
4 of the COCs for the Boarhead Farms
5 site?

6 A. Yes.

7 Q. Now, just talking about
8 those for the moment, are some of
9 those more mobile than others in the
10 subsurface?

11 A. It would -- that's
12 dependent on other factors. There's
13 no kind of generic. It doesn't
14 really lend itself to that kind of
15 general evaluation.

16 Q. What about in the
17 subsurface specifically at the
18 Boarhead Farms site?

19 A. Again, it would depend on
20 the form of the metal you are talking
21 about, for instance chromium VI is
22 going to be a lot more mobile than
23 the other metals and a lot more
24 mobile than chromium III.



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1 So it's hard to make kind
2 of generalized statements about the
3 mobility of a metal versus the
4 mobility of an organic compound.

5 Q. Well, you know, do you not,
6 what the conditions were at points in
7 time when investigated at the
8 Boarhead Farms site, based on your
9 review of administrative record for
10 the site. Is that correct?

11 A. I know some information
12 about the characteristics of
13 different parts of the site at
14 different times.

15 Q. Does that answer reflect
16 that you know only some information
17 because only some information is
18 available, or does that reflect that
19 you don't necessarily know because
20 you haven't studied all of the
21 available information?

22 MR. HARRIS: Objection to
23 the form.

24 THE WITNESS: I think it



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1 reflects neither. I think it
2 reflects the fact that, as we
3 actually read earlier, nobody knows
4 everything about the characteristics
5 of the Boarhead Farms site either
6 geographically or temporally.

7 Many, many things were
8 disposed of at the site in many, many
9 places at the site.

10 They don't know exactly
11 where everything was disposed, what
12 areas were used as disposal areas,
13 they don't know everything that was
14 disposed of at the site or the form.

15 They know that everything
16 from organics to metals to acid
17 wastes in drums and in bulk were
18 disposed of at the site.

19 So it really reflects the
20 fact that this is an extremely
21 heterogenous site and that it was,
22 that many, many different disposal
23 activities took place at the site.

24 Q. Based on the information

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1 that is available and that you have
2 reviewed, and it may be in regard to
3 only some area of the site as opposed
4 to the site as a whole, can you
5 identify any of these six metals as
6 having been more mobile than any of
7 the others?

8 A. No.

9 Q. Do you know what forms of
10 chromium have been detected at the
11 site?

12 A. Well, I believe that the
13 way that they run their analytical
14 procedures they would have detected
15 both -- they would have analyzed for
16 and detected both chromium VI and
17 chromium III.

18 Q. But do you know whether
19 they did?

20 A. I don't remember any
21 specific data, no.

22 Q. Do you know whether any of
23 these six, and if so, which of these
24 six metals were found in drums at the



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1 site?

2 A. No.

3 Q. Do you know which of the
4 six -- excuse me. Do you know
5 whether any of these six metals, and
6 if so which of the six were found in
7 soils of the drum disposal, drum
8 excavation area of the site?

9 A. No.

10 Q. Do you know what metals
11 were present in the naturally
12 occurring geologic formations or
13 materials at the site, the so-called
14 diabase geology and in what
15 concentrations?

16 A. Not without any documents
17 in front of me, I couldn't recite
18 what metals are present in the
19 diabase and certainly not what
20 concentration.

21 Q. Do you have any knowledge
22 or recollection as to which metal, if
23 there is one, was present at the time
24 of the sampling and analysis at the



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1 highest concentrations relative to
2 any other metals detected?

3 MR. HARRIS: Objection to
4 the form.

5 THE WITNESS: No.

6 BY MR. COOLEY:

7 Q. Do you know whether the
8 actual diabase material has been
9 analyzed?

10 A. Are you asking if they have
11 taken a sample of the actual geologic
12 rock?

13 Q. Yes.

14 A. I don't know if they have
15 or not.

16 Q. Is there a way to
17 understand what the rock contains by
18 way of metals without taking a sample
19 of it and analyzing it?

20 A. Sure. You could look at
21 literature descriptions of that kind
22 of diabase and there's very likely
23 information in the literature about
24 the concentration -- the types of and



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1 the concentration of inorganic
2 materials in that geologic formation.

3 Q. Inorganic materials you
4 said?

5 A. Yes.

6 Q. Have you studied the
7 geology in the greater area of the
8 Boarhead Farms site either for
9 purposes of your work on this matter
10 or previously in some unrelated
11 context?

12 MR. HARRIS: Objection to
13 the form.

14 THE WITNESS: Not in any
15 detailed way, no.

16 BY MR. COOLEY:

17 Q. Do you know what kind of
18 variation exists in the concentration
19 of metals in this diabase rock
20 material from distance to distance?
21 And you can identify for me what kind
22 of distance that might be.

23 A. No, I don't.

24 Q. Would you expect to find



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1 very consistent concentrations of
2 metals in the geologic material
3 underlying the Boarhead Farms site
4 from point to point across the site
5 or would you expect to see some
6 notable variation?

7 A. I would expect that you
8 would find some variation. I cannot
9 say what that variation is.

10 Q. Would you expect more or
11 less variation for a particular metal
12 or a group of metals than for some
13 other metals?

14 A. I cannot say.

15 Q. Did you attempt to
16 determine what the metals
17 concentrations are in the geologic
18 materials underlying the site as part
19 of your work on your reports for this
20 matter?

21 A. No.

22 Q. Now, different soil
23 materials, and by that I mean, just
24 for your benefit, materials above



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1 competent geologic material or
2 bedrock, different soils have
3 different degrees of organic material
4 within them. Is that correct?

5 A. In general, yes.

6 Q. For example, some
7 previously or long undisturbed soils
8 here in Philadelphia might have a
9 different organic content than
10 somewhere in Bucks County, than
11 somewhere in Harrisburg.

12 A. Correct.

13 Q. Do you know anything about
14 the degree of organic materials in
15 the soils in the uncontaminated areas
16 of the Boarhead Farms site?

17 MR. HARRIS: Objection to
18 the form.

19 THE WITNESS: Not without a
20 document in front of me. I don't
21 recall specific data on the organic
22 carbon content.

23 BY MR. COOLEY:

24 Q. Is that something you



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1 investigated as part of your work in
2 preparation for your report?

3 MR. HARRIS: Objection to
4 the form.

5 THE WITNESS: To the extent
6 that it was contained in the RI, but
7 I don't recall specifically looking
8 for that information, no.

9 BY MR. COOLEY:

10 Q. You have rendered opinions
11 in your reports, have you not,
12 regarding the potential for acid
13 waste to affect and destroy, I think
14 would be the word, organic content in
15 soils. Is that a fair description?

16 A. Well, again, what we talked
17 about was two very separate
18 phenomenon. One is acid wastes
19 destroying the natural microorganisms
20 in the soil. And then also acid
21 wastes depleting the soil of the
22 organic carbon content.

23 Q. Okay, right. And in both
24 contexts you have opined that acids



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1 can have a destructive effect. Is
2 that generally a fair summary?

3 A. Yes.

4 Q. In order to understand what
5 kind of effect the disposal of acid
6 waste at the Boarhead Farms site
7 might have had on either
8 microorganisms or organic carbon
9 content, would you not need to know
10 what levels of microorganisms and
11 what levels of organic carbon content
12 are found at the site?

13 A. If you were trying to
14 quantify precisely what effect they
15 had, then, yes, you would need to --
16 you would need to evaluate what the
17 organic carbon content was or what
18 the natural population of
19 microorganisms were.

20 Q. But even if you are not
21 trying to do it in some precise
22 quantification exercise but rather in
23 order to understand whether there was
24 any significant impact on the



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1 potential for mobilization of metals
2 based on destruction of
3 microorganisms or destruction of
4 organic carbon content, wouldn't you
5 need to understand what microorganism
6 levels and organic carbon content
7 levels were present to begin with?

8 A. No, not necessarily.

9 Q. Explain yourself, please.

10 A. Well, any soil is going to
11 have some level of organic carbon
12 content.

13 Some soils will have a
14 greater natural organic carbon
15 content than others, but all soils
16 will have some organic carbon
17 content, and those acid wastes will
18 affect that organic carbon content.

19 The precise degree to which
20 they affect them will require a lot
21 more significant evaluation, but it
22 will affect them.

23 Just like acid wastes will
24 mobilize metals in soils, it will



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1 affect and destroy the organic carbon
2 content of the soil.

3 Q. How much of a variation is
4 there, from your experience in
5 working on sites over 20 years, in
6 the degree of organic carbon content
7 from what might be described
8 principally as a clayey soil as
9 opposed to a loamy soil?

10 A. It can vary from anywhere
11 from less than or around one percent
12 to greater than five percent by
13 weight.

14 So a sandy or clayey soil
15 may have a very low organic carbon
16 content -- well, that's probably not
17 a good -- a sandy soil will have a
18 low organic carbon content.

19 A loamy soil could have a
20 very high organic carbon content,
21 upwards of five percent by weight.

22 Q. And can you describe for
23 me, again based on your experience
24 working on sites during your



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1 professional career, of the range you
2 see in microorganism population based
3 on whatever measure or unit is
4 applied to that?

5 A. No, I can't. That really
6 doesn't lend itself to kind of a unit
7 of measure.

8 Q. And I meant from soil type
9 to soil type, if I didn't say that.
10 That was the context of the question.

11 A. Well, only qualitatively.
12 And, again, and it doesn't -- it's
13 similar to the organic carbon
14 content.

15 A sandy soil is going to
16 have a less of a population of
17 natural microorganisms than a humic
18 or a loamy soil, but the exact
19 measure of that is not as precise as
20 the measure of organic carbon
21 content.

22 Q. But it seems that from your
23 answers there's a correlation between
24 the two, you would tend to see more



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1 microorganisms where you have more
2 organic material and less
3 microorganisms where you have less
4 organic material?

5 A. Correct.

6 Q. But that's not something
7 you studied as part of your review of
8 the Boarhead Farms site conditions.

9 MR. HARRIS: Objection to
10 the form.

11 THE WITNESS: I did not
12 study which soils on the Boarhead
13 Farms had more or less organic carbon
14 and microorganisms, no.

15 BY MR. COOLEY:

16 Q. In your reports and your
17 testimony yesterday and today you
18 spent some time talking about
19 mobilization of metals and the
20 factors that can cause an increase or
21 decrease in mobilization of metals in
22 the subsurface.

23 And you have said on a
24 couple of occasions, if not more, in



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1 your deposition here that there are a
2 number of circumstances or conditions
3 or factors that can bear on how much
4 mobilization can occur. Is that a
5 fair summary?

6 A. That's fair, yes.

7 Q. Okay. And I'm wondering if
8 you can provide any description of
9 the circumstances or conditions at
10 the Boarhead site that you have
11 studied to understand what extent of
12 mobilization of metals you could
13 conclude has been promoted as a
14 result of those circumstances and
15 conditions?

16 A. I'm not sure I understood
17 the question.

18 Q. Well, I'm simply trying to
19 state it clearly enough to avoid one
20 of Mr. Harris's objections. But let
21 me elaborate just to help you and
22 then I will try to pose the question
23 again.

24 We talked a minute ago



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1 about soil types, rock formations,
2 microorganism populations. You may
3 have many other factors in mind that
4 bear on the degree to which metals
5 would be mobilized and move or be
6 retarded in their movement.

7 And so my question is, what
8 site-specific, Boarhead Farms site-
9 specific conditions or circumstances
10 of the subsurface have you
11 investigated to help you understand
12 what the migration potential is for
13 metals at that site?

14 MR. HARRIS: Objection to
15 the form.

16 THE WITNESS: Well, I would
17 say the primary factor that I looked
18 at was just the concentration of
19 metals that they are finding in the
20 groundwater in the soil at the site,
21 which indicates, again, along with
22 the information on the kinds of
23 wastes that may have been disposed
24 of, indicate to me, as it indicated

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1 to EPA that metals have been
2 mobilized at the site because of
3 these discharges.

4 BY MR. COOLEY:

5 Q. Other than looking at the
6 concentrations found, did you look
7 at, investigate, study other
8 circumstances, which I think is the
9 word you have used over the course of
10 these two days, or factor is a word I
11 might use, that would bear on how
12 readily metals at the Boarhead Farms
13 site would be mobilized?

14 A. Well, in addition to what I
15 just said, I would say that just the
16 nature of the disposal practices, if
17 you will, and that's probably a
18 fairly generous term at this site,
19 practices, that the nature of the
20 disposal that it was directly to the
21 ground for the bulk liquids, that it
22 was leaking from drums in the
23 subsurface.

24 That kind of intimate



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1 contact with the waste material and
2 the soil would promote and is a
3 factor in evaluating whether or not
4 metals are likely to be mobilized
5 from the waste.

6 So just the disposal -- the
7 information about the disposal
8 practices themselves.

9 Q. But you don't know the pH
10 of the various waste acids that are
11 said to have been disposed at the
12 site, do you?

13 A. I don't recall any pH
14 measurements of the waste, no.

15 Q. That would be a factor as
16 well, would it not?

17 A. It would be a factor if you
18 are trying to determine the precise
19 extent of mobilization.

20 Q. Well, if we said
21 hypothetically that the totality of
22 the liquid acid waste disposed of at
23 the site was from drum to drum and
24 tanker truck to tanker truck 6.95 pH,



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1 every last drop, as one possibility,
2 and the other being every last drop
3 was a pH of 1, it would be fair to
4 say, wouldn't it, that you would
5 expect different effects on
6 mobilization of metals in those two
7 disposal scenarios?

8 A. Everything else being
9 equal?

10 Q. Everything else being
11 equal.

12 A. So the volume?

13 Q. Everything else being
14 equal.

15 A. You would expect different
16 levels of mobilization, yes.

17 THE WITNESS: Is this an
18 okay time for a break?

19 MR. COOLEY: Yes. Any time
20 you want to take a break.

21 (Thereupon, at 12:00 p.m. a
22 luncheon recess was taken until
23 12:55 p.m., at which time the
24 following proceedings were had:)



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1 BY MR. COOLEY:

2 Q. Mr. Vandeven, yesterday
3 there were a series of questions
4 about Handy & Harman wastes and then
5 some questions about individual
6 company wastes as opposed to types of
7 wastes.

8 And in that line of
9 questions you testified, I believe,
10 that you did not have any knowledge,
11 specific or general about the wastes
12 of Handy & Harman.

13 Now, I know there were then
14 some follow-up questions or later
15 questions regarding a certain sludge
16 material. But Mr. Harris then
17 attempted to confirm for us what your
18 opinions would relate to and what
19 they wouldn't relate to.

20 So my question, with that
21 reminder is as follows: Is it true
22 for each of the defendants in this
23 case that you do not have any
24 knowledge specifically about their



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1 wastes generated at their facilities
2 and you are not going to be rendering
3 any opinions about the wastes
4 specifically generated by the
5 defendants in this case?

6 A. That's true, yes.

7 Q. Would the same be true for
8 the plaintiff companies in the case?

9 A. Yes.

10 MR. HARRIS: Just an excess
11 of caution, he will be saying that
12 circuit board etchant may have been
13 disposed at the site and that it's an
14 acidic solution to dissolve copper
15 and manufactured circuit boards, but
16 he won't say that that's in your
17 guy's waste stream versus anybody
18 else's waste stream.

19 BY MR. COOLEY:

20 Q. Okay. Well, why don't we
21 turn then to that page, which I
22 believe is 15 of Vandeven-1, your
23 original expert report.

24 A. You have taken all the



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1 exhibits back.

2 Q. Oh, I'm sorry.

3 Let me direct your
4 attention to the second bullet on
5 Page 15 of your original expert
6 report in which there are several
7 sentences relating to circuit board
8 etchant and spent etchant.

9 A. Okay.

10 Q. Correct me if I'm wrong, my
11 understanding is that it is not your
12 opinion and you are not testifying
13 that Flexible Circuits or Etched
14 Circuits, two of the named parties in
15 this case generated the material that
16 you are describing in this bulleted
17 paragraph.

18 Is that correct?

19 A. That's correct that I am
20 not going to be offering an opinion
21 about that.

22 MR. HARRIS: About whether
23 they did or not.

24 THE WITNESS: Right.



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1 BY MR. COOLEY:

2 Q. Are you going to be
3 offering testimony as a fact witness
4 that either Flexible Circuits or
5 Etched Circuits generated these
6 materials?

7 A. No.

8 Q. And finally, you are not
9 going to be offering testimony of any
10 kind regarding any waste generated by
11 either of those two companies. Is
12 that correct?

13 A. I'm going to be offering
14 testimony about the impact that
15 circuit board etchant waste would
16 have had if it was disposed of at the
17 site.

18 Q. But circuit board etchant
19 in a general sense as opposed to
20 circuit board etchant that may or may
21 not have been generated and disposed
22 of by Flexible Circuits or Etched
23 Circuits. Is that correct?

24 A. That would be correct, yes.



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1 Q. Or put another way, you
2 will not be offering testimony that
3 either Flexible Circuits or Etched
4 Circuits generated the same material
5 that you are describing in this
6 paragraph?

7 A. That's correct.

8 Q. In connection with your
9 review of the administrative record
10 and your work leading up to the
11 writing of your two expert reports,
12 did you investigate or study the
13 matter of groundwater flow direction
14 at the Boarhead Farms site?

15 A. In general, yes.

16 Q. And for what purpose?

17 A. To develop an understanding
18 generally of the characteristics of
19 the site that's a primary
20 characteristic of any contaminated
21 site, the groundwater flow direction.

22 To understand where they
23 put the interceptor trench and why
24 they put it where they put it. Those



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1 were the general reasons to
2 understand groundwater flow
3 direction.

4 Q. Does the information that
5 you learned about groundwater flow
6 direction at the site serve as a
7 basis in whole or in part for any
8 opinion that you are rendering in
9 this case?

10 A. I would say that in
11 general, yes, it's part of the basis
12 for my opinions in this case.

13 Q. How?

14 A. Looking at the groundwater
15 flow direction assists in
16 understanding how contaminants may
17 have migrated at the site and how
18 they may have migrated from areas of
19 past disposal to areas where they
20 were detected during the RI, to
21 understand how the off-site
22 residential wells that needed to be
23 treated, how they were impacted by
24 on-site disposal.



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1 So it's just a very kind of
2 primary component to understanding
3 how the fate and transport of
4 contaminants at a site like this.

5 Q. Were any off-site receptors
6 affected by contaminants disposed of
7 at the site?

8 A. Yes. The off-site
9 residential wells were impacted and
10 required treatment.

11 Q. Okay. Those are two
12 different things, of course. I
13 understand treatment systems were
14 installed and operated at those
15 residences. On what basis do you
16 conclude that on-site waste disposal
17 impacted those residential wells?

18 A. Well, the nature of the
19 contaminants that were found in the
20 wells as compared to the nature of
21 the wastes that were disposed of at
22 the site.

23 Q. What contaminants were
24 found in the wells?



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1 A. Both inorganic and organic
2 contaminants.

3 Q. Regarding the inorganic
4 contaminants, is it your conclusion
5 or opinion, rather, that any of those
6 inorganic substances became present
7 in those off-site wells as a result
8 of migration from the site?

9 A. I believe that that was a
10 part of the conclusion of the RI.

11 Q. Did you reach some
12 independent conclusion as to that
13 based on your own focus on it, or are
14 you simply advising that you have
15 seen that that conclusion was reached
16 by others?

17 A. I did not reach any
18 independent conclusion on that topic,
19 no.

20 Q. Do you know whether there
21 was any remediation of soils at the
22 site solely for metals?

23 A. I don't know if there was
24 any remediation at the site solely



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1 for metals.

2 It's possible that some
3 soil that was excavated as part of
4 the drum removal was disposed of
5 off-site primarily because of the
6 metals content, but I could not say
7 for sure sitting here right now.

8 Q. Would the remedy, and by
9 that I mean all aspects of the
10 overall remedy for this site in
11 different phases, operable units,
12 taken all as a whole, would the
13 remedy for the Boarhead Farms site
14 have been any different had there
15 been no disposal of acids containing
16 metals?

17 MR. HARRIS: Objection to
18 the form.

19 THE WITNESS: Well, I think
20 I addressed this question before, I
21 guess maybe in a slightly
22 different -- the hypothetical was
23 slightly different.

24 On a site like this that's



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1 very difficult to say. I couldn't
2 reach a conclusion or an opinion -- I
3 have not reached a conclusion or an
4 opinion about that, and to do so
5 would require a lot more analysis.

6 The only conclusion that I
7 have reached and opinion that I have
8 formed is that all the wastes
9 disposed of at the site contributed
10 in some manner to the need for the
11 cost of remediation.

12 BY MR. COOLEY:

13 Q. It's your opinion as well,
14 if I understand it correctly, and
15 please tell me if I'm wrong, that
16 even the disposal of inert rock or
17 pick your favorite bottled water at
18 the site would have contributed in
19 some way to the need for remediation
20 at the site?

21 A. Or the cost of remediation
22 at the site, yes.

23 Q. So did rainfall contribute
24 to the cost of remediation at the



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1 site?

2 A. In some way the level of
3 rainfall that you have at a site will
4 impact the need for or cost of the
5 remediation, yes.

6 Q. Are you a soil chemist?

7 A. I wouldn't consider myself
8 a soil chemist, no.

9 Q. In your original report you
10 offer two opinions, the second of
11 which, and now I'm looking at Page 1
12 of that report, Paragraph No. 2 in
13 italics near the bottom of the page.

14 The second of which reads,
15 "All of the wastes disposed of at the
16 Boarhead Farms Superfund site
17 contributed in some manner to the
18 environmental conditions that led to
19 the response activities described
20 above."

21 I would like you to direct
22 your attention to the words
23 "contributed in some manner." What
24 do you mean by the words "some



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1 manner"?

2 And maybe the best way for
3 me to ask that question and so I will
4 retract everything and ask you a
5 fresh one, what are the different --
6 what different manners of
7 contribution to environmental
8 conditions fall within your concept
9 of some manner?

10 A. Well, it could be anything
11 from wastes that were disposed of in
12 bulk historically that contributed in
13 the manner that they would have
14 contributed would have been related
15 primarily to the initial response
16 actions taken by EPA, the initial
17 interest in the site as a potential
18 disposal site. So that's one
19 example.

20 Another example would be
21 the presence of all contaminants at
22 the site would have contributed to
23 the degree that response actions and
24 costs are incurred to install



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1 monitoring wells, retrieve
2 groundwater samples and analyze those
3 samples for those individual
4 constituents.

5 Contributed in some manner
6 could refer to a material such as we
7 have discussed at length over the
8 last two days, acid wastes that have
9 tended to promote and increase the
10 mobility of other wastes or other
11 metals and organics at the site.

12 Contributed in some manner
13 could include contaminants that
14 required EPA or their contractors to
15 develop ARARs or to develop cleanup
16 levels or to analyze and evaluate
17 contaminants of potential concern, or
18 to analyze and evaluate contaminants
19 of concern.

20 Contributed in some manner
21 could include contaminants that were
22 present that required the development
23 of discharge limits.

24 Contributed in some manner



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1 could include contaminants that
2 required EPA to include a specific
3 remedial process unit, such as the
4 metals precipitation unit, or to
5 include a specific unit such as the
6 air stripping system.

7 So that's a list of
8 examples of what contributed in some
9 manner includes.

10 Q. There's the matter of
11 manner and then there's the matter of
12 degree.

13 You don't use the word
14 degree here, but is it fair to say
15 that different types of contaminants
16 and different volumes of contaminants
17 could and generally do at Superfund
18 sites, in your experience, contribute
19 in different degrees to the
20 environmental conditions that lead to
21 response activities?

22 MR. HARRIS: Objection to
23 the form.

24 THE WITNESS: The volume,



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1 and what was the other factor that
2 you -- I know you said volume.

3 MR. COOLEY: Perhaps you
4 can read it back.

5 (The court reporter read
6 back the following:

7 "Q. There's the matter
8 of manner and then there's the matter
9 of degree.

10 You don't use the word
11 degree here, but is it fair to say
12 that different types of contaminants
13 and different volumes of contaminants
14 could and generally do at Superfund
15 sites, in your experience, contribute
16 in different degrees to the
17 environmental conditions that lead to
18 response activities?")

19 THE WITNESS: Yes. Yes,
20 they can. The different types of
21 wastes or the kind of waste it is and
22 the volume of that waste can be
23 factors that lead to different
24 response actions at a Superfund site.



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1 BY MR. COOLEY:

2 Q. And here at the Boarhead
3 Farms site, it's not your opinion, is
4 it, that all of the waste disposed at
5 the site contributed in the same
6 manner, is it?

7 It's instead your opinion
8 that all of the wastes contributed
9 respectively in some manner?

10 A. It's most definitely the
11 latter, yes.

12 Q. And the contribution
13 reflected by various of the wastes
14 disposed of at the Boarhead Farms
15 site was in some cases of a
16 relatively significant manner or a
17 relatively insignificant manner. Is
18 that a fair statement?

19 MR. HARRIS: Objection to
20 the form. He's had an opinion here
21 that steadfastly says that he doesn't
22 know if any particular wastes have
23 been disposed of at the site.

24 Your question assumes that



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1 there is some knowable number that he
2 has considered it for.

3 MR. COOLEY: It doesn't at
4 all. You are misperceiving my
5 question.

6 MR. HARRIS: He has
7 specifically said did impact the
8 site.

9 MR. COOLEY: His opinion is
10 that all of the wastes contributed in
11 some manner to the environmental
12 conditions.

13 MR. HARRIS: Correct.

14 BY MR. COOLEY:

15 Q. And my question is, is it
16 your opinion that certain of the
17 wastes disposed of at the Boarhead
18 Farms Superfund site contributed in
19 relatively less significant way or
20 ways than other of the wastes
21 disposed of at the Boarhead Farms
22 site?

23 A. It was not my intention nor
24 did I do that kind of comparative



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1 analysis between different wastes
2 allegedly disposed of at the site.

3 Q. So you don't know the
4 manner in which any given waste type
5 contributed to the conditions. You
6 know only, and it's your opinion
7 only, that each of the waste type
8 contributed in some manner, whatever
9 that manner might have been?

10 MR. HARRIS: Objection.

11 THE WITNESS: No, that's
12 not the case.

13 In fact, we just went
14 through on Page 15 examples of the
15 manner in which some wastes that may
16 have been disposed of at the site
17 would have contributed to the need
18 for remediation at the site.

19 We have talked about that
20 at length over the last two days.

21 BY MR. COOLEY:

22 Q. Did certain waste types
23 contribute more to the need for
24 remediation?



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1 MR. HARRIS: Objection.

2 MR. COOLEY: Excuse me.

3 Strike that.

4 BY MR. COOLEY:

5 Q. Did certain waste types
6 contribute more to the environmental
7 conditions at the site than other
8 waste types disposed of?

9 MR. HARRIS: Objection to
10 the form.

11 THE WITNESS: I was not
12 asked to render an opinion on that,
13 and I don't have an opinion on that
14 sitting here right now.

15 BY MR. COOLEY:

16 Q. Could you turn your
17 attention, please, to Page 2 of your
18 original expert report, Vandeven-1
19 and look at Paragraph No. 2.

20 And specifically the last
21 part of the second sentence which
22 states in part, "This score was due
23 primarily to elevated levels of
24 organic contaminants (including



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1 trichloroethylene and 1, 1, 1, -
2 trichloroethane) and inorganic
3 contaminants (including zinc,
4 chromium and lead) in groundwater."

5 Are you quoting from or
6 paraphrasing some document in
7 referring to the specified organic
8 and inorganic contaminants that
9 appear in those two parentheses?

10 A. I believe so, yes.

11 Q. Do you know what that
12 document is?

13 A. I believe it was the RI
14 that summarized -- has a ranking
15 system process at the site.

16 Q. Is it your understanding,
17 then, that these specific substances
18 which are identified in the
19 parentheticals in that sentence were
20 deemed to be the primary contaminants
21 associated with the scoring of the
22 site?

23 A. They would have been the
24 primary contaminants associated with



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1 the actual score, the HRS score at
2 the site, yes.

3 Q. That's what I meant, right,
4 okay. In other words, you didn't
5 select those chemicals for inclusion
6 in this sentence, you looked to
7 another source of information and saw
8 those identified.

9 A. That's correct.

10 Q. Could you please turn to
11 Page 3 of your report and look at the
12 top part of the page, which is a
13 carryover of Paragraph No. 3 from
14 Page 2. Please take your time if you
15 would like to look at the entire
16 paragraph.

17 A. Okay.

18 Q. One, two, three, four lines
19 down from the top of Page 3 a
20 sentence begins, "Nearly half of the
21 buried drums removed were empty,
22 which suggests that their contents
23 had leaked out into the environment
24 over time."



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1 The words "which suggest,"
2 are those reflective of your thought
3 or were you really paraphrasing some
4 conclusion of a third party in
5 writing that sentence?

6 A. I believe that conclusion
7 was contained in some of the
8 underlying documents.

9 Q. Do you know whether the
10 empty drums had leaked their contents
11 or whether they were disposed of at
12 the site empty?

13 MR. HARRIS: Objection to
14 the form.

15 THE WITNESS: I don't have
16 any direct information, no.

17 BY MR. COOLEY:

18 Q. Directing your attention
19 now to the bottom of Page 3,
20 paragraph numbered 6, would you
21 please take a look at that paragraph
22 and tell me when you are ready.

23 A. Okay.

24 Q. Is it your understanding



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1 that the EPA concluded that of the
2 metals detected at the site arsenic
3 and chromium presented the greatest
4 risk?

5 A. I believe so, yes.

6 Q. Have you ever worked in the
7 electronics industry?

8 A. No, I have not.

9 Q. Have you ever worked on a
10 project or a matter involving a
11 circuit board manufacturing facility?

12 A. I don't -- I can't say
13 right now that I have ever worked on
14 a site that dealt with a circuit
15 board manufacturing facility, no.

16 Q. On Page 15 of Vandeven-1,
17 returning to that paragraph, bulleted
18 paragraph regarding circuit board
19 etchant, what was the source of the
20 information appearing in that
21 paragraph?

22 A. I believe we looked in
23 general on information -- publicly
24 available information on the web and



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1 possibly in EPA documents regarding
2 the wastes that could be part of
3 circuit board etchant and spent
4 etchant.

5 Q. None of those resources
6 appear referenced in appendix --
7 excuse me, Attachment B to Vandeven-
8 1, do they?

9 A. I don't see anything right
10 now that I could say refers to any of
11 those documents, no.

12 Q. Did Mr. Harris provide you
13 with any information on paper or in a
14 discussion about circuit board
15 etchant or spent etchant?

16 A. No.

17 Q. Did you ever review the
18 Complaint against -- or any of the
19 Complaints? There have been several
20 amendments in this case.

21 A. I seem to remember
22 reviewing a Complaint, but I couldn't
23 say which Complaint it was at this
24 point.



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1 Q. Did you rely on it for any
2 purpose?

3 A. I don't believe so, no.

4 Q. Did you consider it?

5 A. Like I say, all I can
6 recall right now is I may have
7 reviewed a Complaint or something
8 that looked like a Complaint in this
9 matter.

10 Q. Could you please turn your
11 attention to Page 10 and 11 of your
12 initial expert report, Vandeven-1.

13 And just so you know where
14 I'm headed, I'm going to be asking
15 you a question about the first
16 bulleted paragraph on Page 11 within
17 the context of Pages 10 and 11.

18 A. Okay.

19 Q. On Page 10, the paragraph
20 that immediately precedes the
21 bulleted paragraph, I'm referring now
22 to the paragraph beginning with "I
23 have reviewed the record," in that
24 paragraph you state that you



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1 concluded that the response actions
2 taken were necessary to respond to
3 documented threats and risks posed by
4 hazardous substances at the site and
5 that these actions were appropriate
6 and consistent with the NCP.

7 Now, having said that, you
8 proceed to list a number of points in
9 these following bulleted paragraphs.

10 And in the first bulleted
11 paragraph on Page 11, among other
12 things, you refer to groundwater
13 being the sole source of drinking
14 water to 100 residences within one
15 mile of the site.

16 Are you intending to
17 suggest that groundwater
18 contamination threatens drinking
19 water wells of a distance of a mile
20 from the site?

21 MR. HARRIS: Objection to
22 the form.

23 THE WITNESS: No. I was
24 just summarizing what was in the



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1 EE/CA as a characteristic of the site
2 that contributed to the EPA's
3 conclusion that a removal action was
4 appropriate and necessary at the
5 site.

6 BY MR. COOLEY:

7 Q. In your own judgment, with
8 your experience with contaminated
9 sites, and based on your review of
10 the record in this case, do you
11 believe it relevant that there are
12 residences as remote as a mile away
13 to determining whether removal action
14 is appropriate here?

15 A. Yes.

16 Q. Is that another way of
17 saying that you believe that
18 groundwater quality at a distance of
19 a mile was threatened by the
20 conditions at the site?

21 A. Those are two different
22 things.

23 The presence of drinking
24 water wells within a mile of a site



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1 is an explicit consideration within
2 the National Contingency Plan at that
3 time, in the time that we are talking
4 about would be the 1985 NCP.

5 And so the HRS, the hazard
6 ranking system at that time
7 explicitly included in their target
8 factor wells that I think were even
9 further away than a mile.

10 So that characteristic of
11 the site was an explicit
12 consideration in determining whether
13 or not a site was listed and whether
14 or not emergency or removal action
15 was needed at the site.

16 Whether or not wells a mile
17 from the site are actually threatened
18 comes later as you do either the
19 EE/CA, as part of the removal action
20 or the RI/FS as part of the remedial
21 action.

22 Q. Have you reviewed or
23 attempted to determine independently
24 what the organic and inorganic

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1 contaminant plumes are associated
2 with this site?

3 A. I have generally reviewed
4 the distribution of inorganic and
5 organic contamination of the
6 groundwater.

7 Q. With inorganic
8 contamination, have you generally
9 reviewed the matter of plume contours
10 on a contaminant-by-contaminant
11 basis?

12 A. I don't recall getting down
13 to that level of detail, no.

14 Q. Would you describe the
15 inorganic -- excuse me, strike that.
16 Would you describe the organic plume
17 size to be greater than the inorganic
18 plume size?

19 A. I don't know if it was.
20 Without looking back at the
21 underlying documents I can't recall
22 the comparative or relative sizes of
23 the plumes.

24 Q. Did your review of plume



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1 contours, organic and inorganic, at
2 the time you performed that review
3 come to serve as a basis of your
4 opinions in this report in any way?

5 MR. HARRIS: Objection to
6 the form.

7 THE WITNESS: Well, I would
8 say yes to the extent that it
9 confirmed and assisted me in
10 concluding that both the nature of
11 the disposal at the site and then the
12 nature of contaminant distribution at
13 the site is very heterogenous, it
14 occurred in many different places
15 spatially.

16 And therefore understanding
17 where the contaminants were and if
18 they had been described as a plume,
19 understanding where those plumes were
20 helped and assisted me in developing
21 that opinion at the site.

22 BY MR. COOLEY:

23 Q. Did you look at cost
24 documentation for the Boarhead Farms



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1 site, by which I mean documents
2 reflecting actual costs incurred to
3 this point in time or to the point in
4 time that you wrote your reports?

5 A. I did, yes.

6 Q. What documentation did you
7 look at?

8 A. I guess there were various
9 documents.

10 Some documents that
11 summarized what total costs had been
12 incurred to date for certain
13 activities, and then we also looked
14 at the cost documents that were
15 prepared and provided to us by a
16 company called demaximus.

17 Q. I'm sorry, the second
18 category was cost documentation
19 provided to you by demaximus?

20 A. Cost documentation that was
21 developed by demaximus. It could
22 have been provided through counsel,
23 but it was cost documentation or cost
24 documents that were generated by



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1 demaximus.

2 Q. Meaning reflecting work
3 done by demaximus and the cost
4 therefore?

5 A. No. I believe not work
6 done by demaximus but work that had
7 been done at the site by anybody
8 involved at the site, that were just
9 summarized, and the accounting was
10 done and the organization was done by
11 demaximus.

12 Q. And the first category of
13 cost documentation that you reviewed,
14 then, is what? I'm not sure I --

15 A. For instance, that would be
16 information in the ROD or information
17 in other underlying documents that
18 described how much was spent, for
19 instance, on OU1 or how much was
20 spent on components of OU2 that kind
21 of summarize large activities at the
22 site.

23 Q. Did you perform any
24 analysis of either of those two types



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1 of cost documentation that you have
2 just described in an effort to
3 determine whether the expenditures
4 were reasonable, whether the work
5 that had been performed had been
6 performed cost effectively?

7 A. Yes. I did look at it to
8 determine whether or not the costs
9 were reasonable given the magnitude
10 of the costs and what I knew about
11 the complexity of the site and the
12 activities that had taken place at
13 the site.

14 Q. So what specifically did
15 you do as part of that review;
16 meaning, did you go to estimating
17 resources, did you compare your own
18 firm's charges for similar work, did
19 you look at bid packages -- I'm
20 making up hypothetical examples, but
21 I would like to know exactly what you
22 did as part of that review.

23 A. It was more -- and when
24 this kind of opinion is developed



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1 about the reasonableness of costs you
2 can either do it very generally or
3 you can do it kind of invoice by
4 invoice. And the examples that you
5 gave kind of are within those
6 extremes.

7 The analysis that I did
8 here was very general, just looking
9 at large categories of costs and
10 looking at the general activities
11 that were done at the site to
12 determine whether or not they seemed
13 reasonable primarily based on my
14 experience at similar sites and the
15 nature of what I knew about the
16 Boarhead Farms site.

17 Q. So would it be fair to say
18 you did an overall review and you
19 attempted to reach a conclusion about
20 the general reasonableness of the
21 costs in connection with the nature
22 of the work performed?

23 A. That would be a fair
24 statement, yes.



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1 Q. And you did not, therefore,
2 for example, look to determine the
3 specific number of wells that were
4 installed, the depth to which the
5 drillings had to occur, the number of
6 rounds of samples taken, the number
7 of analytes analyzed by the
8 laboratories and do some number
9 crunching to determine whether the
10 costs that you saw were consistent or
11 inconsistent with what you would
12 expect based on your experience?

13 A. That's correct, I did not
14 do that very, very detailed analysis.

15 Q. Do you know whether any
16 aspects of the work done at the site,
17 and by work done I mean by any party
18 under any contract, any operable unit
19 was bid?

20 A. Maybe I'm not understanding
21 the question.

22 Q. Do you know whether a
23 bidding process was utilized
24 preliminary to the contracting with



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1 any consultant or contractor which
2 performed work at the Boarhead Farms
3 site?

4 A. Well, all I can say would
5 be based on my personal experience
6 having been at CH2M HILL at the time,
7 that contract with EPA was bid, they
8 won that contract through a
9 competitive bidding process. So to
10 that degree, yes, a bidding process
11 was used.

12 Q. Beyond your knowledge about
13 the CH2M HILL contract, which had a
14 name you gave us yesterday, ARCS?

15 A. ARCS, yes.

16 Q. Beyond your personal
17 knowledge, recollection about that
18 contract and how it came to be
19 through a bidding process, do I take
20 it and infer that you are not aware
21 one way or the other about any
22 bidding procedures used for any other
23 work at the site?

24 A. Not specifically, no. I



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1 can only speak to my general
2 understanding of how an investigation
3 and remediation proceeds at a site
4 like this. -But I don't have any -
5 specific information on bids or
6 proposals or awarding of contracts at
7 this site.

8 MS. FLAX: Excuse me,
9 counsel. This is Melissa Flax.

10 I'm going to drop off and
11 then dial back in in about five or
12 ten minutes from my mobile. So you
13 can continue going, but I just wanted
14 to let you know that I was dropping
15 off and then will rejoin.

16 MR. COOLEY: Okay.

17 MS. FLAX: Thank you.

18 MR. COOLEY: Thank you.

19 BY MR. COOLEY:

20 Q. Ms. Flax, actually --
21 speaking of Ms. Flax -- yesterday
22 asked you some questions about the
23 second bulleted paragraph on Page 12
24 of Vandeven-1, specifically questions



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1 about what you refer to as the
2 anticipated costs.

3 And I'm not sure if she
4 asked you this question, so I will
5 ask it this way: How do you know
6 that costs which have not yet been
7 incurred will in fact be reasonable
8 until they have been charged and
9 paid?

10 A. Well, as I --

11 MR. HARRIS: I am going to
12 object, but go ahead and answer.

13 THE WITNESS: As I said
14 yesterday, all I'm referring to there
15 is given how the process has
16 proceeded to date at the Boarhead
17 Farms site and given that the
18 requirements and the activities
19 associated with the performance of
20 the RD/RA are requirements that are
21 dictated by the EPA, that it's my
22 opinion that those activities and the
23 costs that are incurred will be
24 reasonable response costs.



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1 BY MR. COOLEY:

2 Q. Well, I think I understand
3 what you are saying to me regarding
4 the nature of the work yet to be
5 performed.

6 To the extent that that
7 work has been described, and to the
8 extent it's being mandated by the
9 EPA, you know what it is, you know
10 why it is to be performed and you can
11 say something about it.

12 The actual costs incurred
13 to perform that work might be costs
14 reflecting gross waste and excess
15 labor, materials or other charges by
16 contractors.

17 I'm not making a
18 prediction, I'm just saying until the
19 bill comes in and is reviewed, you
20 can't say whether that bill is going
21 to be reasonable, can you?

22 A. Well, I can give my opinion
23 about whether or not I think it's
24 going to be reasonable.



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1 And, again, what I'm
2 referring to here is, for example,
3 there will be ongoing costs
4 associated with disposing of the
5 sludge that's generated from the
6 metals precipitation unit and the
7 treatment system.

8 To the extent that that
9 metals precipitation is required, to
10 the extent that costs like that have
11 been incurred already that the
12 contractor and the experience that
13 they have doing that at the site is
14 going to continue in the future that
15 it's my opinion that those costs and
16 the activities associated with those
17 costs will be reasonable.

18 Q. So if we assume a number of
19 things about what's going to happen,
20 or if you assume a number of things
21 about what's going to happen, then on
22 the basis of those assumptions you
23 feel comfortable rendering this
24 opinion, but those assumptions have

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1 to in fact occur for that opinion to
2 hold. Correct?

3 A. I think that in general is
4 correct, but, again, I think those
5 assumptions are a lot more reasonable
6 than assumptions you would have to
7 make for this not to occur.

8 You would have to have EPA
9 do away with all the institutional
10 knowledge that they have gained at
11 the site through the contracts and
12 the consultants that they have used,
13 assume that they are going to retain
14 a disreputable consultant or that the
15 PRPs are going to try to retain a
16 disreputable or wasteful consultant.

17 That the EPA will approve
18 that wasteful consultant, that they
19 will ignore the activities that are
20 taking place at the site starting
21 now, even though that they have been
22 intimately involved for more than a
23 decade and a half.

24 So I think the assumptions



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1 that you would have to make to opine
2 that the costs going forward and the
3 activities going forward are not
4 reasonable are a lot more dramatic
5 assumptions than the assumptions that
6 I have made.

7 Q. Actually, I postulated some
8 extreme case just for purposes of an
9 example.

10 In fact, for costs to be
11 other than reasonable they only need
12 to be just on the outside of the
13 bounds of reasonableness, they don't
14 need to be associated with a
15 disreputable contractor or reflective
16 of fraud or some kind of gross
17 behavior.

18 Isn't that fair to say?

19 MR. HARRIS: Objection.
20 Asking for a legal conclusion and an
21 incorrect legal conclusion, too.

22 THE WITNESS: Yes. I
23 wouldn't know how to respond. I
24 don't know what you mean by however



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1 you termed it, just on the other side
2 of reasonable.

3 BY MR. COOLEY:

4 Q. Well, let me ask you this:
5 Are you trying to define costs as
6 being reasonable if those costs are
7 associated with work performed by
8 anyone other than a disreputable
9 contractor?

10 A. No, I wouldn't say that.
11 No.

12 Q. If a PRP group utilizes a
13 laboratory for analytical work that
14 charges 15 percent more than another
15 EPA-approved laboratory that can do
16 the same work, would you consider the
17 costs charged by the more expensive
18 laboratory to be reasonable?

19 A. It depends on other
20 circumstances. They very well may
21 be. Or put another way, there may be
22 no reason to consider them
23 unreasonable. There may be a
24 capacity issue.



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1 They don't have the
2 capacity at the lab that's ten miles
3 away so they have to send it to a lab
4 that is 25 miles away.

5 There could be specific
6 analytical requirements associated
7 with this site that can't be met by a
8 lab that charges 15 percent less.

9 So there could be any
10 number of reasons that a cost that's
11 slightly more than another cost is
12 considered reasonable.

13 Our lunch may have cost 15
14 percent more than the lunch you ate,
15 we probably both feel like we paid a
16 reasonable amount for our lunch.

17 Q. Well, we are not talking
18 about lunch, we are talking about
19 millions of dollars. And my question
20 asked you to assume that both labs
21 could do the work, not that one was
22 unequipped or incapable for any
23 reason of doing the same work.

24 And I understand your



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1 answer to be not necessarily, but my
2 question to you back would be it
3 could be that the extra 15 percent
4 charge is unnecessary and therefore
5 unreasonable, couldn't it?

6 MR. HARRIS: Objection,
7 that assumes that that's the test.

8 THE WITNESS: Again,
9 it's -- there's so many other factors
10 associated with purchasing that
11 commodity.

12 And, again, whether or not
13 it's millions of dollars or whether
14 or not it is lab costs or a lunch,
15 the concept is the same. There could
16 be other factors associated with why
17 one lab costs 15 percent more than
18 another lab.

19 BY MR. COOLEY:

20 Q. Well, let's make it
21 simple. Let's assume the two labs
22 are completely equivalent in quality,
23 timing, performance, and any other
24 respect that makes a difference to



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1 anyone; the PRPs, the EPA, community,
2 citizens or other, and simply because
3 there was no focus on, concern about
4 or attention to the availability of a
5 cheaper alternative, a PRP group
6 retains the more expensive lab.

7 Would it be reasonable --
8 would the costs paid to that lab fall
9 within the bounds of reasonableness?

10 MR. HARRIS: Objection to
11 the form.

12 THE WITNESS: There could
13 be. Again, in my experience there's
14 no requirement that to find something
15 a reasonable cost it has to be the
16 cheapest cost as you have just
17 postulated. It doesn't have to be
18 the cheapest cost.

19 BY MR. COOLEY:

20 Q. How do you define
21 reasonable?

22 MR. HARRIS: Objection to
23 the form.

24 THE WITNESS: I would



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1 define reasonable in the example that
2 you gave to be costs that are within
3 some range of costs associated with
4 that service or that product or that
5 commodity.

6 BY MR. COOLEY:

7 Q. Are you familiar with the
8 NCP definition of reasonableness?

9 A. I am familiar with it. I
10 could not recite it for you right
11 now.

12 Q. Could you paraphrase it or
13 describe it in any way?

14 A. No, not sitting here right
15 now. No.

16 Q. Could you please turn to
17 Page 13 of Vandeven-1. And let me
18 direct your attention to the second
19 bulleted paragraph, the first
20 sentence.

21 We talked a little earlier
22 about the words "in some manner," but
23 now I would like to direct your focus
24 to the words "conditions that require



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1 response activities."

2 What conditions are you
3 referring to there?

4 A. Any condition at the site
5 that required response activities.

6 Q. Which ones did?

7 A. Examples would include
8 allegations of or evidence that bulk
9 wastes were disposed of at the site.
10 Conditions would include the presence
11 of contaminants in the soil and
12 groundwater.

13 Conditions would include
14 evidence or allegations that drums
15 were buried at the site. Conditions
16 could include the presence of
17 contaminants in the stream at the
18 site or in potable private drinking
19 water wells.

20 So those would be examples
21 of conditions at the site that
22 required response activities.

23 Q. Does the presence of any
24 degree of contamination require



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1 response activities; meaning the
2 detection of some contaminant at any
3 concentration?

4 A. Not necessarily, no.

5 Q. At this site can you
6 identify any contamination at the
7 site that did not require response
8 activities?

9 A. No.

10 Q. Can you identify any
11 contamination at the site that did
12 not require remediation following the
13 completion of the RI/FS process and
14 risk assessment process?

15 A. No.

16 Q. Could you please direct
17 your attention to the top of Page 14,
18 the first full sentence at the top of
19 that page, it begins with "such
20 solutions."

21 And I apologize in advance
22 if I have asked this before, it's
23 been asked and answered, I just don't
24 recall, so I want to make sure that



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1 you're referring in that sentence to
2 metals that were naturally present in
3 soils at the site.

4 Do you know what metals you
5 are referring to there?

6 A. I don't believe I was
7 referring to any specific metal or
8 restricting myself to any specific
9 metal in that statement.

10 Q. If acid or acidic wastes
11 and basic wastes were disposed in a
12 common or same area, would there not
13 be some neutralization effect one of
14 the other?

15 A. Well, any number of
16 reactions, if you will, could have
17 occurred if they were mixed. Some
18 kind of neutralization could have
19 taken place. A more violent reaction
20 could have taken place also that may
21 also have resulted in some
22 neutralization.

23 But anytime that you mix an
24 acidic solution with a basic solution



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1 there's any number of outcomes. A
2 lot also depends on the volume of the
3 two contributing acids and bases.

4 Q. Do you know the extent to
5 which that did or did not occur at
6 the Boarhead Farms site?

7 A. No.

8 Q. Do you know what kind of
9 buffering capacity the soils at the
10 Boarhead Farms site had prior to
11 disposal of wastes at the site?

12 A. No, I do not.

13 Q. Or how much that buffering
14 capacity was impacted by any waste
15 disposal at the site?

16 A. No, I don't.

17 Q. Could you please turn to
18 Page 16 of Vandeven-1, and I will
19 direct your attention to the second
20 full paragraph on the page, the first
21 sentence.

22 A. Okay.

23 Q. In the first sentence you
24 refer to inorganic chemicals and you



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1 follow that with (especially
2 metals). What other inorganic
3 chemicals did you have in mind other
4 than metals?

5 A. Well, I believe I was
6 generally referring there to ammonia,
7 which is inorganic, it is not a
8 metal, and depending on some people,
9 I think that the shorthand is to
10 generally refer to arsenic as a
11 metal, but it really is not a metal,
12 it's an inorganic contaminant.

13 So I think the more
14 accurate category is inorganic, which
15 metals are a subset of that.

16 Q. On the top of Page 4 of
17 Vandeven-1 is a statement that we
18 looked at earlier this afternoon in
19 which you describe that the baseline
20 human health risk assessment
21 concludes that risks are due to
22 elevated levels of VOCs and metals
23 (especially arsenic and chromium).

24 Do I take it that in that



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1 part of your report you happen to be
2 referring to arsenic as a metal?

3 A. That's correct.

4 Q. Now, turning back to Page
5 16 you say, "Need for remediation is
6 driven by inorganic chemicals and
7 organic chemicals," but as for the
8 inorganic chemical part of that
9 sentence you have (especially
10 metals).

11 Would arsenic fall within
12 the word metals, as you use it there?

13 A. I would say in general that
14 it would fall within metals, yes.

15 Q. As you use it in that
16 parentheses?

17 A. Correct.

18 Q. And what other metals would
19 fall within your use of that word in
20 those parentheses?

21 MR. HARRIS: Objection to
22 the form.

23 THE WITNESS: On Page 16?

24 BY MR. COOLEY:



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1 Q. Yes. On Page 16 you have a
2 parenthetical reading (especially
3 metals), and I believe you just said
4 that your use of the word metals
5 there would generally encompass
6 arsenic, and my question is what
7 other metals would it encompass?

8 A. Again, we've talked about
9 this before, I would need to go back
10 and look at the ROD to give you a
11 complete list, but there was a number
12 of metals that drove the need for
13 response actions at the site.

14 Q. Well, in this sentence you
15 are talking about the need for
16 remediation as opposed to response
17 actions. I know yesterday you made a
18 point of talking about your focus on
19 using the term response activities --

20 A. Right.

21 Q. -- which is a broad
22 encompassing term, it incorporates
23 investigat-***7-+*ive activities, for
24 example. I was reading this sentence



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1 to refer to something different.

2 Am I correct that here you
3 are referring to the need for
4 remediation as opposed to the need
5 for response activities?

6 A. Again, we may be -- and we
7 talked about this a little bit
8 yesterday, about the word action or
9 response activities.

10 In general I'm talking
11 about the overall response activities
12 at the site, not necessarily a
13 specific cleanup or remediation
14 process, but the overall response
15 activities at the site.

16 Q. So in this sentence you are
17 not saying, then, that remediation or
18 the need for remediation is
19 necessarily driven by organic
20 chemicals, especially metals, but
21 that response activities were driven
22 by those substances?

23 A. I don't think there's -- I
24 don't really think there's any



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1 difference.

2 I think both the response
3 activities were driven by a large
4 group of inorganic and organic
5 contaminants, and actual remedial
6 elements, actual cleanup processes,
7 be it the metals precipitation or the
8 air stripping system or the
9 residential home well treatment
10 systems or the soil aeration were
11 also driven by a large list of
12 inorganic and organic contaminants.

13 Q. Inorganic and organic, is
14 that what you said?

15 A. Inorganic and -- inorganic
16 in addition to organic contaminants.

17 Q. Right. Are those lists one
18 in the same or are there some
19 contaminants, whether organic or
20 inorganic which in your opinion drove
21 the need for response activities
22 other than remediation but did not
23 necessarily drive the need for
24 remediation?



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1 MR. HARRIS: Objection to
2 the form.

3 THE WITNESS: I didn't
4 really look at it to that level of
5 detail, no.

6 BY MR. COOLEY:

7 Q. In that same paragraph, the
8 third sentence you state, "Releases
9 of ferric chloride, ammonia, sulfuric
10 acid and copper ammonium carbonate
11 are documented in the files of state
12 and local agencies."

13 Did you review only reports
14 that referred to documented releases
15 of those substances, or did you
16 review what I will call the
17 underlying or first generation
18 documents concerning such releases?

19 A. I believe both.

20 I believe that there were
21 some documents in the file relating
22 to the contemporaneous, if you will,
23 information regarding those early
24 1970s releases from the state



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1 agencies or the local health
2 department.

3 I think it was a
4 combination of the local health
5 department and the Pennsylvania state
6 regulators.

7 Q. That you reviewed?

8 A. Yes.

9 Q. In the next sentence you
10 say, "these and other wastes released
11 in bulk". What other wastes released
12 in bulk are you referring to there?

13 A. I believe there I'm
14 referring to other wastes such as
15 acid wastes where there's evidence
16 that those wastes were released in
17 bulk as opposed to contained in
18 drums.

19 Q. Evidence or allegations or
20 both?

21 A. Well, the way that I looked
22 at this is there's information, be it
23 in the underlying investigation
24 documents summarized by the EPA, that



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1 those releases may have occurred at
2 the site.

3 Q. So is it fair to say your
4 reference to other wastes released in
5 bulk is a way of summarizing the
6 descriptions in various documents
7 that there were such disposals as
8 opposed to your having certain
9 specific bulk releases in mind?

10 A. That's correct.

11 Q. And you go on to say that,
12 "These wastes likely contain
13 substantial quantities of metals,
14 such as iron, nickel, chromium,
15 cobalt," et cetera. "Likely
16 contain," on what do you base those
17 words?

18 A. Well, again, they are based
19 on a combination of looking at the
20 specific material that could have
21 been released at the site, for
22 example, ferric chloride, which
23 likely contained or did contain iron,
24 that's one example.



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1 And also information about
2 what general -- what contaminants are
3 generally found in specific kinds of
4 wastes if they were disposed of at
5 the site, like spent etchant, looking
6 at general information about what
7 that waste stream contains in
8 combination with looking at whether
9 or not those compounds have been
10 found at the site.

11 Q. Are each of the substances
12 that you identify in the sentence we
13 were just reviewing, the sentence
14 beginning with "these and other
15 wastes released in bulk," are each of
16 those identified substances found in
17 the subsurface at the Boarhead Farms
18 site in substantial quantities?

19 MR. HARRIS: Objection to
20 the form.

21 THE WITNESS: Well, I doubt
22 very much that gold was found in
23 substantial quantities.

24 But I would say that most



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1 of these compounds were found at
2 concentrations that required some
3 either evaluation by EPA or action on
4 the part of EPA or its contractors.

5 BY MR. COOLEY:

6 Q. Other than gold, is there
7 any substance identified in that
8 sentence that you would say was not
9 found in substantial quantities at
10 the site?

11 A. Again, I would have to go
12 back and look -- to say anything more
13 than that, I would have to go back
14 and look at the underlying data.

15 Q. You read Dr. Exner's expert
16 report, I think you said. Correct?

17 A. Yes, sir.

18 Q. In a portion of his report
19 I will represent to you that he
20 described his understanding of
21 processes conducted at Flexible
22 Circuits and waste generated by
23 Flexible Circuits.

24 And in part of his



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1 discussion in his report he stated
2 that Flexible Circuits used wave
3 soldering or performed wave
4 soldering. Do you agree with that?

5 A. I don't have any basis to
6 agree or disagree with that.

7 Q. In your rebuttal report on
8 Page 1, and this is Vandeven-5, I
9 believe. I will give this to you.
10 I'm sorry.

11 So Page 1, the paragraph
12 appearing just below the bullets, the
13 last sentence you state, "I accept
14 and agree with Dr. Exner's
15 descriptions of the wastes associated
16 with the various industries and
17 defendants."

18 My question is, on what
19 basis do you accept, and secondly on
20 what basis do you agree with his
21 descriptions?

22 MR. HARRIS: Objection. We
23 have been over this several times.

24 THE WITNESS: Well, I think



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1 as I have said before, that really
2 refers to the specific review of
3 Dr. Exner's description of the acids
4 that may have been disposed of at the
5 site.

6 I did not review in any
7 detailed way any of the other
8 descriptions of the waste streams or
9 the companies or the processes that
10 he addresses in his report.

11 I was -- I went back and
12 looked at his report for the specific
13 purpose of determining whether or not
14 there was information about the types
15 of acids or the strength of the acids
16 that were disposed of at the site or
17 may have been disposed of at the
18 site.

19 MR. COOLEY: Glenn, I know
20 we have covered this to some extent
21 and I'm not out to beat a dead horse,
22 but I do see a distinction in the
23 sentence at the very end between
24 associated with various industries



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1 and associated with various
2 defendants.

3 MR. HARRIS: Okay.

4 MR. COOLEY: And I don't
5 know whether you are comfortable with
6 a stated understanding that
7 Mr. Vandeven's testimony would
8 include an acceptance, an agreement
9 on his part with what Dr. Exner has
10 described about industries generally
11 as opposed to individual defendants
12 specifically, because on its face
13 this sentence uses both words.

14 MR. HARRIS: I think --
15 well, he can tell me if I'm wrong,
16 but I think it's fair to say that
17 other than the acid wastes which he
18 says somewhere in this thing include
19 strong acids, the descriptions of
20 industries' wastes do not appear on
21 this report anyway, they appeared in
22 his first report.

23 So he is not going to
24 testify that I think Exner is right



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1 about what's generally in pickle
2 liquor. He had his own opinion about
3 what he thought was in pickle liquor.
4 That's in his first report.

5 So he's not going to on the
6 witness stand say oh, yes, I reviewed
7 everything that Exner said about the
8 printed circuit board industry and I
9 agree with everything that he said,
10 he's not going to say that.

11 He's going to say what he
12 said in his own report, Vandeven No.
13 1, as to what was generally in
14 circuit board etchants and waste.

15 MR. COOLEY: Nor is he
16 going to say, I take it, that I have
17 looked at what Dr. Exner said about a
18 given defendant company's waste and I
19 accept and agree with that.

20 MR. HARRIS: Correct.

21 MR. COOLEY: So would it be
22 fair to say that this sentence
23 doesn't really even need to be here?

24 MR. HARRIS: I think that's



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1 probably right.

2 He wanted to understand, as
3 he has testified at length, get a
4 better understanding of the types of
5 acids that might have been disposed
6 of at the site and that led to his
7 statement on whatever page it is of
8 this thing that these acid wastes
9 generally contain strong acids;
10 sulfuric, hydrochloric and nitrates,
11 in some cases at very high
12 concentrations.

13 That's the sentence this is
14 the whole thing is about, and that's
15 all it's about.

16 BY MR. COOLEY:

17 Q. Could you please turn your
18 attention to Page 3 of Vandeven-5,
19 your rebuttal report, and I direct
20 your attention to the second bullet
21 on that page.

22 The last sentence of that
23 bullet states "A substantial portion
24 of this cost --" meaning the



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1 \$4,280,150 cost figure identified in
2 the previous sentence -- "can be
3 attributed to the levels of metals
4 found in some of the materials, which
5 cause them to be classified and
6 handled as characteristic hazardous
7 wastes."

8 Can you elaborate or
9 specify what you mean by a
10 "substantial portion"?

11 A. No. I can't give you a
12 precise breakdown or what it would --
13 that's simply to address the issue of
14 if they were not characteristic
15 hazardous wastes the disposal costs
16 would have been substantially less.

17 I did not try to determine
18 what those costs would have been.

19 But that's just referring
20 to the fact that if something is a
21 hazardous waste, it's clearly going
22 to cost more to dispose of than if
23 it's not a hazardous waste.

24 Q. Could you please turn your

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1 attention to Page 5 of Vandeven-5,
2 your rebuttal report, specifically
3 the third bullet.

4 A. Okay.

5 Q. In that bullet paragraph
6 you refer to the RI indicating that a
7 pH reading below one was obtained in
8 the swamp a few days after a bulk
9 release of ferric chloride in late
10 October '73.

11 You go on to say that lime
12 was spread in the affected area and
13 that dying fish and trees were
14 reported about half a mile from the
15 release site in January of '74 and pH
16 measurements made at three locations
17 in July '74 were only 2.9.

18 Do you know one way or the
19 other whether there were any other
20 disposals of acid wastes or other
21 contaminants between October '73 and
22 January '74 or between January '74
23 and July '74 in the same area or
24 areas being described here?



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1 A. No, I don't.

2 Q. Are you trying to suggest
3 in this report that these dying fish
4 and tree conditions were associated
5 with the October '73 bulk release of
6 ferric chloride that you referred to?

7 A. I believe that that's what
8 the RI is saying.

9 Q. Would it be fair to say
10 that if there were some other bulk
11 release at a later point in time that
12 that would or could be a cause or the
13 cause of a later discovered dying
14 fish or trees?

15 MR. HARRIS: Objection to
16 the form.

17 THE WITNESS: I believe
18 that that could have contributed to
19 that situation, yes, as I have said
20 before. All releases contributed in
21 some manner to the effects at the
22 site.

23 So if there were other
24 releases of acids at that time or in



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1 between that time, it could have
2 contributed to that, yes.

3 BY MR. COOLEY:

4 Q. But you say in this same
5 bulleted paragraph in the last
6 sentence, "'Short-lived' is a
7 relative term; that the facts
8 demonstrate that the effects of bulk
9 disposal of acid waste persisted for
10 months (if not longer) even after
11 lime was applied, and that these
12 effects were observed at a
13 considerable distance from the
14 disposal location."

15 Am I reading that
16 correctly, that you are accepting as
17 a fact that the October '73 purported
18 release of ferrous chloride caused
19 the dying fish and tree conditions
20 and the 2.9 pH measurement in July
21 '74?

22 A. Yes. I'm taking that fact
23 from the RI.

24 Q. You are taking it and



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1 accepting it but you don't know
2 whether from any independent review
3 of underlying analytical reports,
4 field notes, driver deposition
5 testimony or any other information
6 whether in fact there could be other
7 factors or causes of the dead fish
8 and trees in July '74 pH value, do
9 you?

10 A. No, I don't.

11 Q. In most of the bulleted
12 paragraphs that begin at the bottom
13 of Page 4 of Vandeven-5 and carry
14 through to the middle of Page 6 of
15 Vandeven-5 you either quote from or
16 refer to the RI as a source of what
17 you have written.

18 However, in the first
19 bullet at the top of Page 6 I do not
20 see any reference to the RI.

21 Is it the case that what
22 you have stated there is based upon
23 statements in the RI, or is there
24 some other source or sources for the



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1 statements made there?

2 A. I believe that at the very
3 least the first sentence there about
4 the proximity of the drums to areas
5 where bulk wastes were likely
6 disposed, that came from the RI,
7 either narrative in the RI or figures
8 in the RI.

9 Q. How about the statement
10 that metal drums were placed in soils
11 that had been affected by earlier
12 releases of acids, is the source of
13 that information in the RI?

14 MR. HARRIS: Objection to
15 the form.

16 THE WITNESS: No. That's
17 not necessarily from the RI.

18 That's a conclusion of mine
19 that if drums were placed in soils
20 that had been affected by releases
21 from acids that those drums would
22 deteriorate faster because of the
23 presence of acids.

24 BY MR. COOLEY:



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1 Q. Well, does the fact that,
2 as stated in the RI, that drums were
3 removed from areas that are down
4 gradient of some of the likely bulk
5 disposal locations mean that
6 materials disposed in the bulk
7 disposal locations actually migrated
8 to become located later in the area
9 that became the drum disposal area?

10 A. I didn't follow that.

11 Q. Well, the first sentence of
12 this bullet, which you have
13 identified as being based upon the
14 RI, states that drums were removed
15 from areas that are down gradient of
16 likely bulk disposal locations.

17 If we accept that as a
18 fact, that fact does not necessarily
19 mean, does it, that materials
20 disposed in the bulk disposal
21 locations migrated to reach the drum
22 disposal area?

23 Put another way, the drum
24 disposal area might have been down



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1 gradient of the likely bulk disposal
2 locations, but that doesn't
3 necessarily mean that the bulk
4 materials disposed up gradient
5 reached the drum disposal area, does
6 it?

7 A. Right. It doesn't
8 necessarily mean that, no.

9 Q. And you didn't do any
10 independent calculation to try to
11 determine that, did you?

12 A. No.

13 Q. At the bottom of Page 6 of
14 Vandeven-5 there's a bulleted
15 paragraph which reads, "Even if their
16 pH was nearly neutral, releases of
17 large quantities of liquids would
18 cause increased migration of
19 materials into the subsurface.

20 This would tend to reduce
21 the concentrations of hazardous
22 substances and spread them over a
23 larger area.

24 Unless the concentrations



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1 were reduced to levels below the
2 applicable standards, these effects
3 could increase the area to be
4 remediated and the volumes of areas
5 needing to be addressed thus
6 increasing the total response costs."

7 Isn't it possible that the
8 release of large quantities of
9 liquids with near neutral pH or the
10 infiltration of large quantities of
11 rainfall, precipitation in this area
12 over time could tend to reduce the
13 concentrations of hazardous
14 substances and spread them over a
15 larger area and thereby limit and
16 reduce the extent of remediation work
17 required as compared to what would
18 have been required had there been no
19 introduction of large quantities of
20 near neutral pH materials or large
21 amounts of rainfall?

22 MR. HARRIS: Objection to
23 the form.

24 THE WITNESS: I would say



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DEPOSITION OF JAY VANDEVEN, VOLUME II, 2/14/07

1 no. Almost always it's less costly
2 to remediate a smaller volume of
3 concentrated material than it is to
4 remediate a larger volume of less
5 concentrated material.

6 So if you have disposal of
7 a bulk liquid that's near neutral pH,
8 as you have postulated, and that
9 tended to spread out the
10 contamination over a larger area,
11 that, in general, would be more
12 expensive to remediate than if that
13 bulk liquid had not been disposed of
14 and you just had a smaller volume of
15 higher concentration material.

16 BY MR. COOLEY:

17 Q. But that's not necessarily
18 true in every case. Is that a fair
19 statement?

20 A. Not necessarily true in --
21 yes, it's not necessarily true in
22 every case.

23 Q. Now, in this case have you
24 analyzed the extent to which what I



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1 will call dilution, if you would
2 accept that term as a single word to
3 describe the phenomenon we are
4 talking about, resulted in higher or
5 lower costs than what would have been
6 incurred if there were no such
7 dilution?

8 A. I'm sorry, can you just
9 repeat that? I lost the first part.

10 Q. Sure.

11 MR. COOLEY: I retract the
12 question.

13 I may have one or two, but
14 I will hand the ball over to Ed.

15 THE WITNESS: Can we take a
16 quick five minutes?

17 (Recess taken)

EXAMINATION

18 BY MR. FACKENTHAL:

19 Q. Mr. Vandeven, we didn't
20 introduce ourselves yet. I'm Edward
21 Fackenthal.
22

23 I represent one of the
24 defendants, and the defendant I



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1 represent is NRM Investment Company,
2 and in its earlier form that was
3 known as National Rolling Mills,
4 that's a steel company out in Paoli,
5 near Paoli, Pennsylvania.

6 And my greatest interest in
7 this controversy has to do with
8 pickle liquor and the effect of
9 pickle liquor. So most of my
10 questions are going to be devoted to
11 that subject.

12 I think Mr. Cooley and
13 Mr. Pettit yesterday covered most of
14 the other questions that I had, so
15 I'm really going to focus on that.

16 What I'm going to start
17 with, I have made a copy of some of
18 the remedies required by the ROD. As
19 you may remember, there were seven of
20 them, there were seven paragraphs
21 dealing with the remedies.

22 Now, I have only one copy
23 of this, and maybe I can share it
24 with you. I am going to read one by

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